## CLAIMS

1. A method for detecting the greatest number from a plurality of Numbers $Z_1$, $Z_2$,..., $Z_R$, comprising:

a) dividing each of said Numbers into two or more binary Segments $Z_j^{(N-1)}, Z_j^{(N-2)},..., Z_j^{(0)}$, where the bit length of said Segments is determined according to their level of significance and where sets of said Segments are arranged according to their level of significance wherein the first set of Segments $Z_j^{(N-1)}, Z_j^{(N-1)},..., Z_j^{(N-1)}$ includes the Most Significant Segments of said Numbers and the last set of Segments $Z_j^{(0)}, Z_j^{(0)},..., Z_j^{(0)}$ includes the Least Significant Segments of said Numbers;

b) simultaneously comparing the numerical values of the Segments $Z_1^{(K)}, Z_2^{(K)},..., Z_R^{(K)}$ having the same level of Significance, determining a group designating the Numbers which the numerical value of their Most Significant Segment is the greatest, and evaluating for the Least Significant Segments a Grade indicating their numerical size in comparison with the numerical value of the other Segments of the same level of significance;

c) starting from the second set of Segments $Z_1^{(N-2)}, Z_2^{(N-2)},..., Z_R^{(N-1)}$, comparing the Grades of the Segments of the Numbers which corresponds to said group, and removing from said group any Number indication with a Grade that is less than the highest Grade which corresponds to another Number indication in said group;

d) repeating step c) until the last set of Segments $Z_1^{(0)}, Z_2^{(0)},..., Z_R^{(0)}$ is reached or until a single Number is designated by said group.

2. A method according to claim 1, wherein the Numbers are the depth values of pixels of multiple three-dimensional raster images.

3. A method according to claim 1, further comprising comparing the Numbers with a threshold value and carrying out the detection of the

greatest number only with the Numbers which their value is above or below said threshold value.

4. A method according to claim 1, for determining the smallest number, wherein the group is determined to designate the Numbers which the numerical value of their Most Significant Segment is the smallest and the Numbers designations are removed from said group whenever their Grade is greater than the smallest Grade which corresponds to another Number indication in said group.

5. A method according to claim 1, wherein the all the segments are of the same bit length.

6. A method according to claim 1, wherein the bit length of one or more of the Least Significant Segments is greater than the bit length of the Most Significant Segment.

7. A method for compositing a plurality of three-dimensional Sub-Images by examining the Depth values $Z_1$, $Z_2$,..., $Z_R$, of the Pixels corresponding to same spatial location in each Sub-Image and compositing the content of the Pixel having the greatest Depth value, comprising:

a) dividing each of said Depth values into two or more binary Segments $Z_j^{(N-1)}, Z_j^{(N-2)}, \ldots, Z_j^{(0)}$, where the bit length of said Segments is determined according to their level of significance and where sets of said Segments are arranged according to their level of significance wherein the first set of Segments $Z_j^{(N-1)}, Z_j^{(N-1)}, \ldots, Z_j^{(N-1)}$ includes the Most Significant Segments of said Depth values and the last set of Segments $Z_j^{(0)}, Z_j^{(0)}, \ldots, Z_j^{(0)}$ includes the Least Significant Segments of said Depth values;

b) simultaneously comparing the numerical values of the Segments $Z_1^{(K)}, Z_2^{(K)}, \ldots, Z_R^{(K)}$ having the same level of Significance, determining a group

designating the Depth values which the numerical value of their Most Significant Segment is the greatest, and evaluating for the Least Significant Segments a Grade indicating their numerical size in comparison with the numerical value of the other Segments of the same level of significance;

c) starting from the second set of Segments $Z_1^{(N-2)}, Z_2^{(N-2)}, \ldots, Z_R^{(N-1)}$, comparing the Grades of the Segments of the Depth values which corresponds to said group, and removing from said group any Depth value indication with a Grade that is less than the highest Grade which corresponds to another Depth values in said group;

d) repeating step c) until the last set of Segments $Z_1^{(0)}, Z_2^{(0)}, \ldots, Z_R^{(0)}$ is reached or until a single Depth values is designated said group.

8. A method according to claim 7, further comprising comparing the Depth values with a threshold value and carrying out the detection of the greatest number only with the Depth values which their value is above or below said threshold value.

9. A method according to claim 7, for determining the smallest number, wherein the group is determined to designate the Depth values which the numerical value of their Most Significant Segment is the smallest and the Depth values designations are removed from said group whenever their Grade is greater than the smallest Grade which corresponds to another Number indication in said group.

10. A method according to claim 7, wherein the all the segments are of the same bit length.

11. A method according to claim 7, wherein the bit length of one or more of the Least Significant Segments is greater than the bit length of the Most Significant Segment.

12. A system for compositing a plurality of three-dimensional Sub-Images, comprising:

a) Bus lines for concurrently introducing the bits of a plurality of Depth values of pixels, where on each Bus line the bits having the same level of significance are introduced, the logical state of said lines is set to "1" whenever the logical state of all of said bits is "1", and it is set to "0" if the logical state of at least one of said bits is "0";

b) Associative Units for concurrently reading the data of the pixels corresponding to the same spatial location in said Sub-Images, dividing the Depth value of each read pixel into two or more segments, introducing said segments on the respective lines of said Bus, sensing the logical state of said lines, and accordingly concurrently producing intermediate comparison results for the Most Significant Segments of said values which designates the Depth values having the greatest numerical value, and for the Least Significant Segments Stop-Marks Grading indicating their numerical size in comparison with the numerical value of the other Segments of the same level of significance;

c) Promotion Matrices for serially producing intermediate comparison results for each subsequent set of segments in order of significance, starting from the set of segments following the set of Most Significant Segments, by removing from the previously produced intermediate comparison results Depth value designations for which the corresponding Stop-Mark Grading is less than the greatest Stop-Mark Grading that is related to one of said intermediate comparison results,

where said Promotion Matrices are capable of indicating that the currently produced intermediate comparison results includes a single designation such that the pixel data can be retrieved for the compositing from the respective Associative Unit.

13. A system according to claim 12, further comprising disabling means for disabling the operation of subsequent Promotion Matrices whenever it is indicated by a Promotion Matrix that the currently produced intermediate comparison results includes a single designation.

14. The system of claim 12, wherein the system is implemented on a single integrated circuit chip.

15. The system of claim 12, wherein the chip is a VLSI implementation.

16. An Associative Unit for introducing the bits of segments of a Depth value of a pixel on the lines of Wired-AND Bus, issuing Carry-Out and Stop-Mark indications, and enabling the data of said pixel according to a corresponding external enabling indication, comprising:

a) Primary Segment Logic circuitry for enabling the introducing of the bits of the Most Significant Segment of said Depth value on the respective lines of said Bus, sensing the logical state of said lines starting from the Most Significant line, and if the logical states of the sensed line and of the corresponding bit is "0" disabling the sensing of the consecutive Bus lines, otherwise enabling the sensing to proceed until the end of said Segment and issuing a Carry-Out indication;

b) One or more Non-Primary Segment logic circuitries for enabling the introducing of the bits of the Least Significant Segments of said Depth value on the respective lines of said Bus, sensing the logical state of said lines starting from the Most Significant line, and if the logical states of the sensed line and of the corresponding bit is "0" disabling the sensing of the consecutive Bus lines and issuing a Stop-Mark indication which corresponds to the level of significance of said bit in its Segment, otherwise enabling the sensing to proceed until the end of said Segment and issuing a Stop-Mark indication having level of significance being one level higher than the Most Significant bit in said Segment; and

c) a gate for enabling the output of said data whenever said enabling indication is received,

where the logical state of each line of said Bus is set to "1" whenever the logical state of all of the bits introduced on it is "1", and it is set to "0" if the logical state of at least one of said bits is "0", and where said enabling indication is determined externally according to said Carry-Out and Stop-Mark indications.

17. An Associative Unit according to claim 16, further comprising means for enabling the operation of the Primary and Non-Primary Segment logic circuitries whenever the value of the Depth value is greater than a threshold value.

18. An Associative Unit according to claim 17, wherein the means are enabling the operation of the Primary and Non-Primary Segment logic circuitries whenever the value of the Depth value is smaller than a threshold value.

19. An Associative Unit according to claim 16, in which the sensing of the consecutive Bus lines is disabled whenever the logical states of the sensed line and of the corresponding bit is "1".